DEF-02N

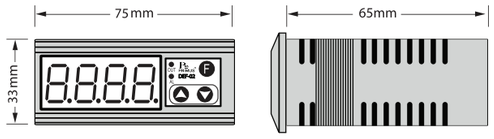
TECHNICAL SPECIFICATION

Type	DEF-02N
Supply voltage	10-30 VAC, VDC
	220VAC ±10 %
Input quantity	1
Input type	0-20 mA.,4-20 mA.,0-10 VDC
Accuracy	±0.5%FS , room temperature @ 25 ˚C
Input signal convert time	250 mSec. / 0.25 Sec
Display	7-Segment
Output quantity	1 Out (3A. 250 VAC)
Alarm quantity	1 alarm (3A. 250 VAC)
Operation temperature	0 to + 60 ˚C
Standard protection	IP40
Control function	Heating/ Cooling
	Hysteresis 0-100˚C(ON/OFF)
Decimal	1-3
Start delay time	0-99.59 min
Hysteresis time = On/OFF delay	0-99.59 min

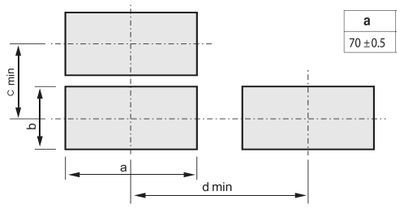
Table 1. Select input sensors and setting range.

Symbol	Input Type	Setting Range/Display Range	
		Non-decimal point	Decimal point
00	0-20mA	-1999~9999	-199.9 ~999.9
01	4-20mA		-19.99 ~99.99
02	0-10VDC		-1.999 ~9.999

DIMENSION

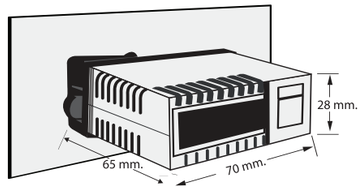


CUTTING PANEL



a	b	c	d
70 ±0.5	28 ±0.5	34 ±0.5	75 ±0.5

INSTALLATION



DESCRIPTION

- DEF - 02N is a digital controller and display Receive input signal from 0 - 20 mA., 4 - 20 mA., 0 - 10 VDC
- Display with 7 - Segment Red LED 4 digits
- The temperature display area can be seen in Table 1.
- Can set the decimal point 1 position
- Compact size Suitable for installation in front of the cabinet with limited space
- 1 set of Main Relay can choose to work as Control / Alarm has 1 alarm relay (Option model only)
- Hysteresis time with 0 - 99.59 min
- Relay output can work both Heating and Colling, Hysteresis can be set and make a unit or time value

DESCRIPTION

DEF - 02N device is a temperature controller that is compact and compact. There is a control function of ON / OFF Control, which can choose two types of control, namely heating / cooling function and alarm function which can be selected in one main relay. For Option-B models, there is an Alarm relay for additional use from Main Relay

Operation control with ON / OFF control

The ON / OFF Control operation of DEF-02N can be selected. There are two types of control: Heating / Cooling. In addition, ON / OFF Control can also select control mode in two ways:

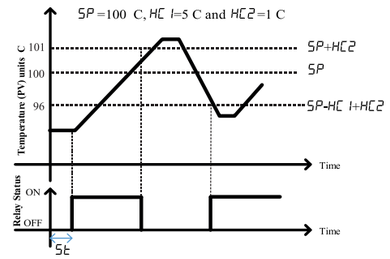
1. Hysteresis Mode is to set the distance of ON and OFF in degrees C or F, can be defined from 0-100. The functions in this function are shown in Figure 1.

2. Time Mode uses Time ON and Time OFF delay. At the point of set point Value in minutes (min), can be set from 00:00 to 99:59 minutes, with two digits in front of the decimal point is the minute value set to 0 and 99, and two digits after the decimal point is Seconds can be set from 00 to 59. The functions in this function are shown in Figure 2

In addition, the control can also set start delay time with units. In minutes to delay the operation of Main Relay and Relay Alarm during the first power-on time To prevent the ON / OFF Actuator too fast, such as In the event of a sudden shutdown or a power failure, the Actuator may be turned ON / OFF suddenly, causing the compressor or heater to be damaged

Start Delay Time can be set from 00.01 to 99.59 minutes, with double digit on the decimal point is the minute value set to 0 and 99, and the two digits after the decimal point are seconds, can be set from 00 to 59, in the case of digits, minutes greater than 0 and 01 to 59, when the minute digit is 0

Heating Control, Hysteresis mode Con=01,
SP =100 C, HC I=5 C and HC2=1 C



Cooling Control, Hysteresis mode Con=00,
SP =15 C, HC I=5 C and HC2=1 C

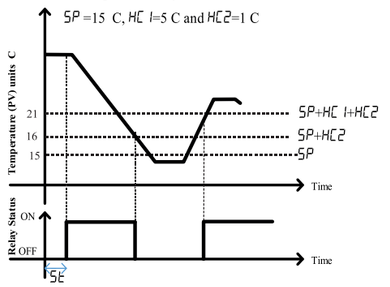
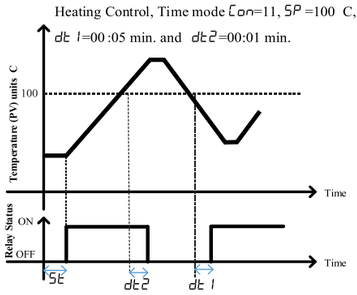


Figure 1 show operation of ON / OFF Controller in Hysteresis mode

Heating Control, Time mode Con=11, SP =100 C,
dt I=00:05 min. and dt2=00:01 min.



Cooling Control, Time mode Con=1, SP =15 C,
dt I=00:05 min. and dt2=00:01 min

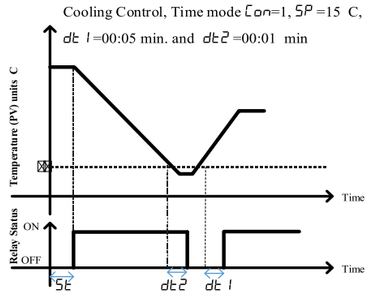


Figure 2 show operation of ON / OFF Controller using time (time) as hysteresis in minutes

Alarm system operation

Alarm system operation user can select the working pattern total of 8 forms, showing the work as shown in Figure 3 and can be classified into 2 types of work:

1. Deviation in which the value used to judge the operation of the relay will run according to or relative to the value of setpoint value , divided into 4 types: High-Low alarm, High alarm, low alarm and High-Low range alarm. For example, set SP = 100 C, select High alarm and High alarm limit made with 10 will cause the Alarm Relay to run when the temperature is higher than 110 C. If the user has changed the SP value to 120 C, the alarm relay will work when the temperature is higher than 130 C details see table alarm function

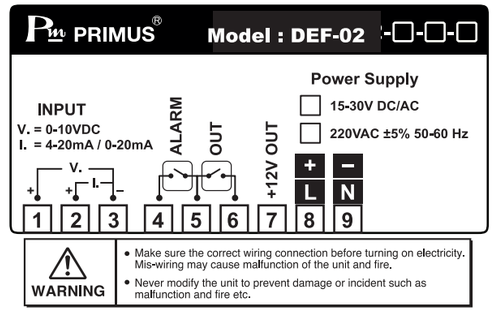
2. Absolute value used to judge the relay operation is separated into independent with set point value or it can be said that it is the setting of the temperature of the relay operation without the SP value calculated by dividing into 4 types: High - Low alarm, High alarm, low alarm and High-Low range alarm. For example, setting SP = 100 C, selecting High alarm and alarm with high limit made with 110, will cause Alarm relay to work when the temperature is higher than 110 C. The work has changed the SP value to 120 C, so the Alarm relay will still work at 110 as before details, see the topic alarm output

Function selection of Main Relay and Alarm Relay operation

Since the relay of the DEF - 02N is able to choose between ON / OFF control or alarm Function for Main Relay, the relay function can be selected as follows:

1. DEF - 02N - A has only one main relay, allowing to select work can be the absolute output or alarm function of 4 types: Absolute High - Low alarm, Absolute High alarm, Absolute low alarm and Absolute High-Low range alarm
2. DEF - 02N - A - B has Main Relay and Alarm Relay can be select operation
   2.1 In the event that Main Relay is an Output Function, can select heat control or cooling can cause the alarm relay to choose the operation .There are 8 types of deviation and absolute alarm according to table alarm function
   2.2 In the case of Main Relay as Alarm Function, the Main Relay And Alarm Relay can select all 4 functions, namely Absolute alarm according to Table Alarm Function

WIRING DIAGRAM



ORDERING CODE

DEF - 02N - A - B -

CODE	Supply
24	10-30 VAC/VDC
220	220 VAC ±10% 50-60 Hz

CODE	OPTION
B	Relay / Alarm

CODE	Output
A	1 Output Relay/Alarm

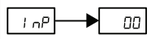
• Power ON

When the device starts working (Start supplying power)The device will display 8888 flashing for a time4 seconds after that will display the Input type

• Show Version

Device will display the latest version

• Show Input Type



Device will display inP and the number of Input Type that has been previously defined after That the device shows the measured PV value

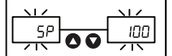
Press F hold 2 sec

• Operation mode display

Displays the current measured PV value by displaying The decimal point effect depends on the parameter setting dP That was previously set
When you want to edit or view the set point value (SP)Can also be done by pressing the button ▼ or ▲

No button press for 10 sec

Setpoint Value (SP)



Use button ▲ ▼ Setting setpoint value according toWhile setting the desired value, the display shows the SP (SP Value) value alternating with the letter "SP"

1. Input type setting

Select input type
00 is 0-20 mA
01 is 4-20 mA
02 is 0-10 VDC
Area of measurement for each type of input type
View Input Table 1 details

F Key

2. PV correction

PuS used to compensate for the PV
The device can read to get the desired result
This value will be added to the PV value. Which will be used to display and control highest minimum valueThat can be set up with Input Type. See details Input table 1

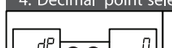
F Key

3. Filter Input

LPF is the number of sequences of work digital filter of process value (PV) makes measured values are changed slower, which can be set. can be from 0 -15 Sec

F Key

4. Decimal point selection



Used for setting the display to have a decimal point or not. Which can be selected as follows

0	Display 4 digits with no decimal point
0.0	Display 4 digits with 1 decimal point
0.00	Display 4 digits with 2 decimal point
0.000	Display 4 digits with 3 decimal point

F Key

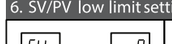
5. Key lock setting

Used for key lock operation
Makes it impossible to use the key
Can choose 4 types:

0	No lock key (None)
1	Has a lock for every parameter (all lock)
2	There is a lock key that only Operate parameter (Operation mode lock only)
3	There is a lock key at Setting parameter only (except operation mode)

F Key

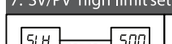
6. SV/PV low limit setting



Set the minimum can be found in table 1

F Key

7. SV/PV high limit setting



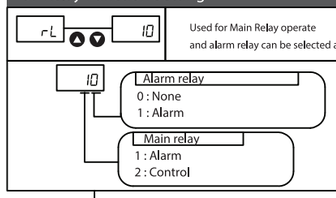
Set the maximum can be found in table 1

F Key

8. Start Time

Start time is used to delay the operation of Main Relay and Option Relay at machine startup
Which can be set to 00.01 to 99.59 Min

9. Relay Function Setting



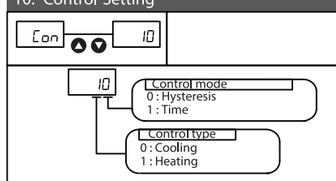
Used for Main Relay operate and alarm relay can be selected as follows

Alarm relay
0 : None
1 : Alarm

Main relay
1 : Alarm
2 : Control

F Key

10. Control Setting



Control mode
0 : Hysteresis
1 : Time

Control type
0 : Cooling
1 : Heating

In case of selecting Control mode as Hysteresis mode, the user can set the parameter value HC1, HC2 and if Control mode is selected as Time, users will be able to set parameter dt1, dt2

F Key

11. Hysteresis 1 for Output Control

Is the value used to calculate the relay's ON point when selecting the Control Mode as Hysteresis for control PV as needed by setting up can be 0 to 100 C

F Key

12. Hysteresis 2 for Output Control

Is the value used to calculate the OFF point of the relay When selecting the Control Mode as Hysteresis for control PV as needed by setting up can be 0 to 100 C

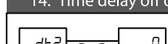
F Key

13. Time delay on output

Is the time that the Timer is used for the ON delay of Relay when selecting Control Mode to Time Which can be set to 00.00 to 99.59 Min

F Key

14. Time delay off output



Is the time that Timer is used for the OFF delay of Relay when selecting Control Mode to Time Which can be set to 00.00 to 99.59 Min

F Key

15. Function Alarm use by Main Relay

Used to select Function Alarm for Main Relay will be used when Main Relay is set Work as Alarm. See details at Parameter rL for Main Relay can be selected absolute only

PV Alarmfunctions
1 to 4 can not use in Main Relay
1 : Absolute value High Low Band Alarm
2 : Absolute value High Alarm
3 : Absolute value Low Alarm
4 : Absolute value High Low Range Alarm

Additional Alarm functions
0 : None
1 : Stand-by sequence

16. Alarm high limite setting use by Main Relay

Used for calculating the high limit to provide alarmcan work by setting the maximum minimum according to the range in measurement of input type. See details at table1

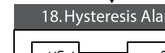
F Key

17. Alarm low limite setting use by Main Relay

Used for calculating the low limit to provide alarm can work by setting the maximum minimum according to the range in measurement of input type. See details at table1

F Key

18. Hysteresis Alarm use by main Relay



Used for calculating the working point of the alarm. Can be set from 0 to 10 or 0.0 to 10.0

F Key

19. Function Alarm use by Alarm Relay

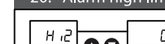
Used to select the Function Alarm for Alarm Relay. If Main Relay is set to work alarm with Alarm Relay can be selected but absolute but if Main Relay is selected Control can select both deviation and absolute

PV Alarmfunctions
1 : Absolute value High Low Band Alarm
2 : Absolute value High Alarm
3 : Absolute value Low Alarm
4 : Absolute value High Low Range Alarm
5 : Deviation High Low Band Alarm
6 : Deviation High Alarm
7 : Deviation Low Alarm
8 : Deviation High Low Range Alarm

Additional Alarm functions
0 : None
1 : Stand-by sequence

F Key

20. Alarm high limite setting use by Alarm Relay



For the Alarm Relay to calculate the high limit
To allow the alarm to work by setting the maximum value Minimum according to the measurement range of Input Type See details at table1

F Key

21. Alarm low limite setting use by Alarm Relay

For the Alarm Relay to calculate the low limit
To allow the alarm to work by setting the maximum value Minimum according to the measurement range of Input Type See details at table1

F Key

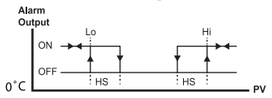
22. Hysteresis Alarm use by Alarm Relay

Used for calculating the working point of the alarm. Can be set from 0 to 10 or 0.0 to 10.0

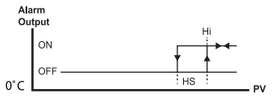
■ ALARM OUTPUT : Process value (PV) to be used as Alarm Output.

Stand-by sequence : After starting operation of step, alarm output does not turn on unlesthe process value reach the value of OFF position of alarm output.

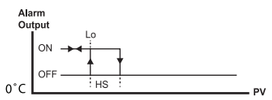
1. Absolute value High Low Band Alarm



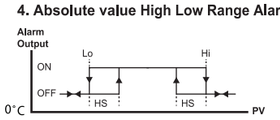
2. Absolute value High Alarm



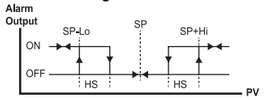
3. Absolute value Low Alarm



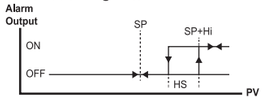
4. Absolute value High Low Range Alarm



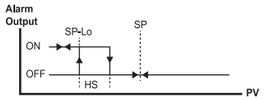
5. Deviation High Low Band Alarm



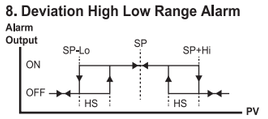
6. Deviation High Alarm



7. Deviation Low Alarm



8. Deviation High Low Range Alarm



บริษัท ไพรมัส จำกัด
119 ซ.สี่ม่วงอนุสรณ์ ถ.สุทธิสารวินิจฉัย แขวงดินแดง
เขตดินแดง กรุงเทพ 10400
โทร 0-2693-7005, 0-2277-8027 แฟกซ์ 0-2277-3565
E-mail : sales@primusthai.com